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# Prairie Dog Management in South Dakota

*Sandy Huber, Extension educator*
*Jim Wilson, Extension Pesticide Education coordinator*

The black-tailed prairie dog (*Cynomys ludovicianus* Ord) is a native rodent found throughout the short- and mixed-grass prairies of North America. The US Fish and Wildlife Service (USDI USFWS 2006) estimated that black-tailed prairie dogs occupied about 1,842,000 acres in 2004. Of that, over 411,400 acres were located in South Dakota.

Prairie dogs are clearly valuable as a component of grassland ecosystems, providing habitat to a number of plant and animal species. Prairie dogs clip vegetation short within their towns to enhance their ability to see predators (King 1955). As a result, they compete with livestock for forage on the grasslands of South Dakota (Stoltenberg et al. 2004), leading to substantial losses to ranchers when prairie dog towns are large (Beutler et al. 2005).

Many producers have decided that, in order to prevent serious losses of livestock forage on their pastures, they must control/manage prairie dog numbers. Once a producer has made the decision to manage prairie dog numbers, it is extremely important that they understand 1) the biology of prairie dogs, 2) factors that affect their spread onto new rangelands, 3) control options and appropriate/legal methods, 4) regulations regarding timing of control and methods allowed, and 5) non-prairie dog considerations.

## I. BIOLOGY

The black-tailed prairie dog is the only species of prairie dog that lives in South Dakota. As adults, these relatively large burrowing rodents range from 14- to 17-inches long and weigh between 1.5 and 3 pounds. They vary in color from brown to tan, with a lighter belly and the characteristic black tail. Adults tend to be darker than the young.

Prairie dogs live in colonies called towns. They feed primarily on the grasses of the prairie in the western two-thirds of South Dakota. Generally, prairie dogs prefer areas with shorter vegetation and slopes ranging from 2 to 4%, which helps them detect predators (Koford 1958; Reading and Matchett 1997). Constant clipping of vegetation by prairie dogs creates a shift from taller to shorter grass height (Winter et al. 2002; Archer et al. 1987) and from cool-season to warm-season grasses. Closely grazed areas around stock ponds, windmills, salt licks, or farmsteads are often areas where prairie dogs begin establishing their town. The effects of drought and overgrazing aid in the initiation and expansion of prairie dog towns.

The black-tailed prairie dog is only active during daylight hours, and while they are not extremely active during periods of cold, blustery weather, they are not true hibernators. Prairie dogs live in burrows about 10 yards apart, 3- to 14-feet deep, and 10- to more than 100-feet long. The number of burrows per acre has been reported to be as many as 100, with around 50 being more common for established towns. Many openings are small, temporary dodge holes with little if any excavated dirt present at the openings. The main burrows have mounds of dirt ½- to 1-foot high at the entrance to serve as a lookout station as well as to prevent water from rushing in during a rainstorm or winter thaw.

The black-tailed prairie dog breeds in late January and February. The gestation period is 33 to 38 days. Prairie dogs have one litter per year, consisting of 1 to 6 young (the average is 3) that are born in March and April (Hoogland 2005). The pups open their eyes at about 5 weeks, emerge from the burrows at 6 weeks, and are weaned at about 7 weeks of age. Dispersal of the year-old juveniles and a few adults takes place in late spring. Prairie dogs generally move less than 2 miles, but a few have gone as far as 6 miles.

## II. CONTROL METHODS

### A. Biological Control

Natural predators, disease, and parasites can have an impact on the population of prairie dogs. But unless the predation rate is unnaturally high, it won't significantly reduce prairie dog numbers. Predators are more attracted to areas with higher densities of prairie dogs than to lower density areas. Predation by a variety of the prairie dog's natural predators can be enhanced by providing cover for foxes and coyotes, and by providing perches for raptors.

Disease and parasites can also reduce populations, although these typically do not result in large die-offs of prairie dogs. One exception is sylvatic plague, which was first detected in southwestern South Dakota in September 2004 (SD Animal Industry Board et al. 2004) (Smith 2005) and which is responsible for the elimination of most prairie dogs on thousands of acres on the Pine Ridge Indian Reservation in 2005 (SD Animal Industry Board et al. 2004) (Smith 2005). Since that time, drought conditions in western South Dakota have led to large increases in prairie dog numbers. Prairie dog die-offs due to sylvatic plague have been documented in the Conata Basin area of Pennington County as recently as May 2008 (South Dakota GFP 2008).

While plague reduces prairie dog populations, it is also a human health concern. Plague is usually transmitted to humans by the bites of fleas from infected rodents. People living near prairie dog towns or people baiting towns with possible infections should take precautions. It is also important to be aware that pets such as dogs and cats may pick up infected fleas in a prairie dog town and transmit them to humans.

### B. Cultural Control

Careful range management can aid in prairie dog management. Regulating the number of livestock and the grazing periods to optimize forage height and production can help deter the expansion of prairie dogs. To reduce areas where prairie dogs will likely become established, the careful distribution and location of watering facilities, salt licks, and other factors that tend to concentrate livestock and result in overgrazing must be considered.

### C. Mechanical Control

Shooting, trapping, grazing management, and various barriers have all been suggested as possible options for prairie dog control. Shooting can help keep a small town small. Colorado State University Extension (Andelt et al. 2003) reports that intensive shooting in February and March will sometimes help control numbers because it disrupts reproductive activities. However, it is often difficult to find sport shooters willing to shoot prairie dogs on areas that are not high density and on towns that are accustomed to shooting.

Prairie dogs that are not accustomed to hearing shots being fired will quickly go into their burrows and leave little for the shooters to shoot at. One method of overcoming this is to place propane cannons out in an area for several days prior to shooting taking place. Over the span of a couple of days, the prairie dogs will become used to the loud bangs and be less apt to take cover once the shooting starts. Trapping is not a very practical control method as it is expensive and time consuming.

Rest/rotation grazing and other grazing systems that allow the height and biomass of vegetation in a pasture to increase create vegetation barriers that may provide cover for predators, create visual barriers for prairie dogs, and slow prairie dog expansion (Terrall et at. 2006). Visual barriers of burlap or windrows of small pine trees have been reported to slow colony expansion in Colorado (Andelt et al. 2003); however, the use of artificial barriers is usually limited due to high construction and maintenance costs.

### D. Chemical Control

In South Dakota there are three different types of products registered for use on prairie dogs: 1) zinc phosphide bait, 2) aluminum phosphide tablets or pellets, and 3) gas cartridges. In order to purchase and apply restricted-use pesticide or to apply general-use pesticide to rangeland in South Dakota, one must be a certified pesticide applicator. Pesticide certification training sessions and testing are available through the SDSU Cooperative Extension Service; the South Dakota Department of Agriculture regulates the certifications. Once certified, it is still critical to read and follow all label directions before using any of these products.

**1. Zinc phosphide** is a slow-acting toxicant that is labeled as a restricted-use pesticide. It can be absorbed in small amounts through the skin, so precautions must be taken and rubber gloves used when working with this chemical. Poison baits such as zinc phosphide are only effective when the prairie dog's most desirable food, green grass, has become dry and dormant, so fall baiting is generally the most successful. The label produced by the South Dakota Department of Agriculture for zinc phosphide bait states that zinc phosphide can only be applied from July through January. However, a Special Local Needs (SLN) label is in place in South Dakota through 2009, which allows baiting until March 1; you must have this supplemental label in hand when baiting at this time.

Spring baiting is often unsuccessful because pregnant females often are not found aboveground, bad weather is common, and once green grass is available bait acceptance is poor. The application of zinc phosphide on a particular parcel of land is federally restricted to a single application in each July-through-January period. Many commercial and agency operators prefer to not treat more often than every other year as survivors of the treatment will often become bait-shy and not consume the bait. Prairie dogs do not live much longer than 2 years, so treating every second year puts the bait in front of naive animals. If used properly, this bait offers about 90-plus percent control.

Because of zinc phosphide's prominent odor, which is similar to garlic or carbide, and its grayish-black color, prairie dogs are often hesitant to eat it. For this reason, the label requires pre-baiting first using good quality oats. Pre-bait by thinly sprinkling one heaping teaspoon (about 4 grams) of good quality oats on the outer edge of the mounds. If too little is applied the degree of control may suffer. When too much is applied, it may be consumed by other animals. This can result in the accidental deaths of non-target animals when you are applying the actual bait.

Pre-baiting early in the morning will give the best results, as you will get the bait down before they are coming out to feed. Do not place pre-bait it in loose dirt or vegetation, on top of the mound, or down the burrows. Do not place pre-bait in piles, but rather sprinkle it around. Start at one edge of town and work across it to cause the least disturbance to the prairie dogs. Pre-bait every hole, whether it looks active or not, because the prairie dogs will often venture to other mounds and dodge holes to feed. Once the pre-bait is down, leave the town and do not come back for 3 or 4 days. At this time you need to check to see if the pre-bait was eaten. If it was, then proceed with baiting. If it was not, postpone the application of bait a few more days and check again. If weather or other unforeseen circumstances prevent poisoning within 10 days, then it will be necessary to pre-bait again in order to achieve good results.

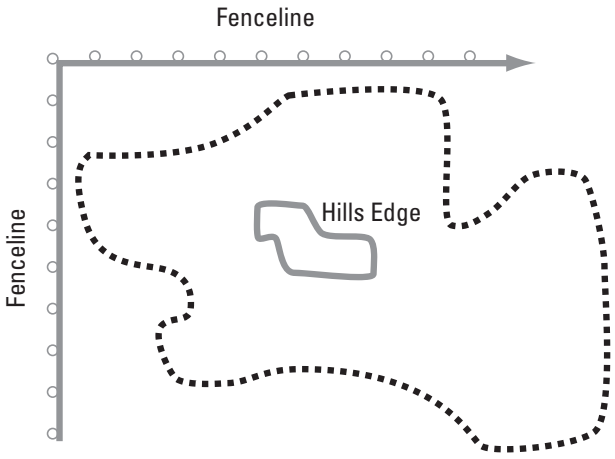
Follow the same pre-bait procedure to apply the bait. A typical prairie dog town will require 1/3 to 1 pound of bait per acre, depending on the density of the burrows. It is in your best interest both economically and environmentally to not exceed the recommended rate. Apply one heaping teaspoon of bait to each hole only if the pre-bait was consumed. Do not apply if there is still pre-bait on the mound. Carefully read and follow label instructions before applying bait. Wear rubber gloves to avoid contact with the chemical. Also, take extra care to avoid breathing zinc phosphide dust. Personnel working indoors with the chemical should wear appropriate respirators. For best results, check the weather conditions before baiting. Zinc phosphide turns into the toxic phosphine gas if exposed to moisture, so rain, heavy dew, or snow will probably reduce the toxicity of the bait.

**a. Marking a prairie dog town prior to baiting**

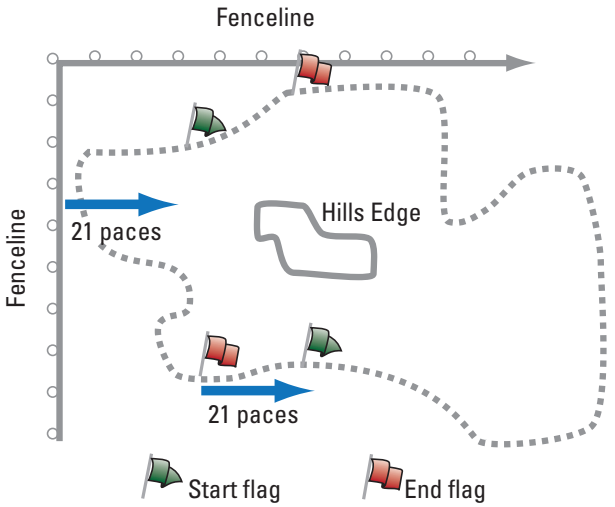
When baiting large areas, flagging the town first will allow quicker pre-baiting and baiting and ensure that all burrows are treated for more effective control. To flag a prairie dog town, use the following procedure (provided by Scott Huber, South Dakota GF&P Animal Damage Control).

**Single pickup (truck) system**

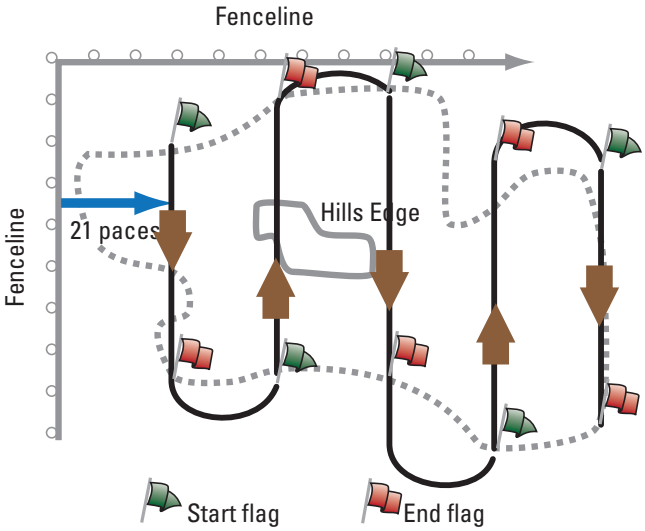
1) Figure 1. Drive the perimeter of the prairie dog town with a pickup to create wheel tracks on the boundary; the tracks will serve as turning points when flagging the town. Keep all active holes within this perimeter track.




2) Figure 2. Use a fence as your starting point or pick an object on the opposite end of the longest part of the dog town and drive a straight line. From the fence (or line), pace over a predetermined distance and set a starting flag. This distance is based on how densely populated the town is, how thick the vegetation is (thick vegetation can hinder the ability to see the holes), and how many people are available to help with baiting. About 6 to 7 paces per person is a comfortable distance between baiters for most soil and sod conditions. Pace over the same distance from the first flag and set a return flag. Move to the other end of the dog town and repeat the flagging. The first flags parallel with the fence will mark the first transect you are about to drive.



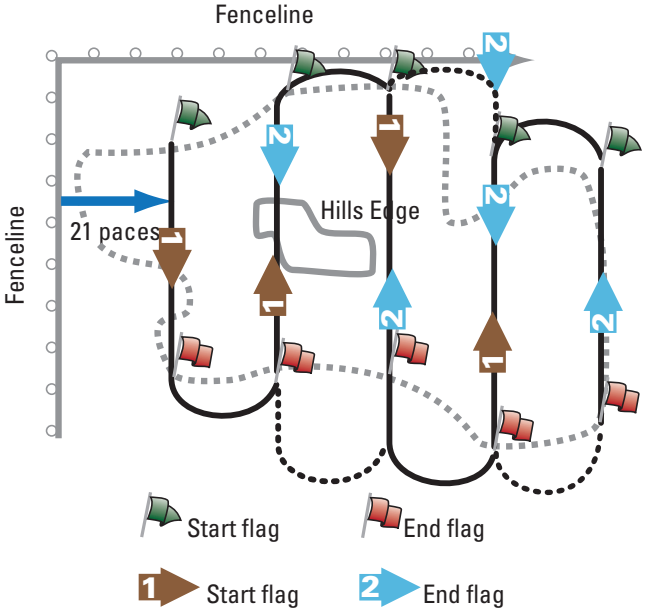
3) Figure 3. Drive from the first start flag to the ending flag. When you reach the tire tracks marking the perimeter, turn to line up with the next set of flags, then pace over and set a return flag. Repeat the driving and pacing until you have marked the entire prairie dog town.




4) For long prairie dog towns or hilly country, for the driver to stay in line it may be necessary for someone to carry a marker such as a white rag or bleach jug on a pole. When flagging irregular-shaped dog towns, to make square corners at the ends, walk up and down the perimeter pickup tracks before pacing over.
5) In soil or vegetation conditions where the vehicle track transects are not visible, drag something that will leave a mark behind the pickup.

**Two pickup (truck) system**

1) Figure 4. When using two pickups, drive the first pickup along the starting line (which is either parallel to a straight fence or in a straight line to an object you have selected on the opposite end of the longest part of the dog town). Drive the second pickup a *predetermined distance, parallel to the first pickup, as they simultaneously cross the dog town.




*The predetermined distance (6 to 7 paces) can be adjusted to fit the varying conditions mentioned above.
2) After the first transect is driven, the first pickup returns in the wheel track made by the second pickup. The second pickup either paces over the predetermined distance or estimates that distance and drives parallel to the first pickup on the return transect. Retracing each wheel mark will make them more visible and easier when it's time to bait. This process is continued until equally spaced transects cover the entire dog town.

**b. Proper pre-baiting and baiting techniques for flagged towns**

Bring sufficient help so that the town can be baited as quickly and quietly as possible. The less the prairie dogs are disturbed, the better the expected degree of control. Sufficient help for baiting would be 3 to 5 people.

1) To prevent doubling up or missing holes, line up between the pickup track transects at one edge and stay in line while working through the dog town.
2) Stay evenly spaced so one person is not doing most of the holes.
3) Avoid turning around for missed holes while using ATVs.
4) The outside people are responsible for keeping track of the pickup tracks and should try to stay even with one another to keep everyone else in line. In the sunlight these pickup tracks will show up better one way than the other.
5) All ATV riders should use hand signals between each other to prevent missing holes. Be as quiet as possible and try to stay evenly spaced and evenly paced.
6) Work a dog town from one side to the other, and leave from the side you just finished to reduce disturbance. If the prairie dogs are spooked after baiting they may only eat enough to get sick; bait shyness will then result.
7) Avoid placing bait in piles. Zinc phosphide is poisonous to all animals. Spreading the bait as required on the label will reduce the hazard to other animals.
8) To prevent bait shyness, stop baiting about 1 hour before sundown and before a storm system moves in.
9) Stay completely away from the dog town for about 1 week after baiting.
10) Treat remaining active burrows with aluminum phosphide.

Carefully store any remaining zinc phosphide bait in a watertight building away from children, animals, and any other being that may unwittingly expose itself to the poison. When exposed to moisture, zinc phosphide releases

phosphine gas, which is highly flammable and extremely toxic.

**2. Aluminum phosphide** is a restricted-use pesticide that is usually available in both tablet and pellet form. It emits phosphine gas when it comes into contact with moisture and air. Phosphine gas is very toxic to all life forms that may inhale it, and it is also highly flammable. Follow the label instructions before use. The aluminum phosphide label states that you must have a fumigation management plan completed and in your files before using the product. An example fumigation management plan can be found on the South Dakota Department of Agriculture website at http://www.state.sd.us/doa/das/hp-pest.htm.

Aluminum phosphide is often known by trade names such as Phostoxin or Fumitoxin. For the most effective result, the best time to apply aluminum phosphide is in the early spring when soils are moist. While this method is very effective, it can be costly and very labor intensive to do many holes; therefore, this method works best as a cleanup method or on very small colonies.

Wear cotton gloves and a long sleeved shirt when handling aluminum phosphide. Do not wear rubber gloves because you may sweat in them (the moisture could activate dust from the tablets, trapping the gas between the glove and your hand). In general, 5 pellets generate the same amount of gas as 1 tablet. When treating prairie dog towns, treat only the burrows that are active. Throw either 2 to 4 tablets or 10 to 20 pellets down the burrow, making sure to keep the canister downwind so you do not inhale the gas. Do not apply water to the burrow after application because the rapid release of the phosphine gas may cause an explosion or flashback.

Once the pellets or tablets have been applied, plug the burrow with newspaper or a paper plate and place dirt on top to seal the hole. Seal all burrow openings within at least a 50-foot radius of the treated openings. If there is a question whether an adjoining burrow is connected, treat and seal it as well.

**3. Gas cartridges** are general-use pesticides that are available from the South Dakota Department of Agriculture. They should be lit, placed in the burrow, and the burrow sealed in a similar manner as when using aluminum phosphide. Gas cartridges produce carbon monoxide, which is toxic to humans as well as any animals residing in the burrows. Wear gloves and a long-sleeved shirt when applying. Avoid breathing any smoke. Because you are working with a lit fuse, use caution if pastures are dry. Once the fuse is in place and lit, carefully drop it down the hole and plug the burrow. Watch for escaping smoke and cover those areas.

While gas cartridges may work well as cleanup methods, they are very labor intensive and are not recommended for general control on towns larger than 1 or 2 acres.

## E. Non-target Considerations

All attempts should be made to avoid poisoning non-target species while trying to control prairie dogs.

**1. The black-footed ferret** is listed as an endangered species in South Dakota and is entirely dependent upon prairie dogs and their burrows for food and shelter. The State of South Dakota has been block-cleared of extant wild ferret populations (which means that all the known ferrets in South Dakota are there as a result of ferret reintroduction efforts). Wild ferret populations in South Dakota have been reintroduced as nonessential, experimental populations, and this means that producers do not need to have approval before poisoning. However, because the black-footed ferret is a protected species, when planning to use pesticides in prairie dog towns, it is important for landowners to first check for signs of the ferret. If the presence of the black-footed ferret is suspected, it is advised to check with the U.S. Fish & Wildlife Service before fumigating. Landowners can also check with the U.S. Fish & Wildlife Service in Pierre (605-224-8693, ext. 232) to learn if they are close to a ferret reintroduction area (which at the time of this printing has only occurred on Federal or Tribal land).

As night is when ferrets are active, preliminary surveys should be conduced at night with the use of lights; this is something that landowners can do. Also, watch for the following signs when pre-baiting:

- characteristic ferret trenching
- freshly excavated dirt at the burrow before the prairie dogs become active in the morning
- a high number of burrows with the entrances plugged

Black-footed ferrets have been reintroduced into three prairie dog complexes in Dewey, Pennington, Lyman, and Todd counties, with plans for additional reintroductions in Custer and Stanley counties. In 2005, South Dakota was home to approximately 60% (403 individuals) of the known (665 individuals) black-footed ferrets that exist in the wild in North America. Agencies working to restore ferrets in South Dakota include the U.S. Forest Service, the U.S. Fish and Wildlife Service, the National Park Service, the Bureau of Indian Affairs, the Animal Plant Health Inspection Service, the Cheyenne River Sioux Tribe, the Lower Brule Sioux Tribe, the Rosebud Sioux Tribe, and many private organizations and individuals.

**2. Other Animals:** Abandoned and active prairie dog burrows may be occupied by several other animal species, including the swift fox, badgers, burrowing owls, rabbits, and rattlesnakes and other reptiles. Being exposed to fumigants can kill all of these species. Look for signs of these animals before treating burrows with either aluminum phosphide or gas cartridges.

### F. Record Keeping

When applying restricted use pesticides such as zinc phosphide or aluminum phosphide, applicators must keep records. Private applicators must record all information within 14 days of application of restricted-use products and keep the records for 2 years. The information needs to include:

- applicator name, address, and phone number
- applicator's certification number
- date of application
- location of application
- product name and EPA registration number
- pest treated and site location
- total amount of pesticide applied

Commercial pesticide applicators must keep records of all applications, whether general- or restricted-use products.

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Additional information provided by:

Scott Huber, SD GFP, Animal Damage Control, Kadoka, SD

Tim Pugh, USDA, APHIS, Wildlife Services, Pierre, SD

Art Smith, SD GFP, Program Administrator, Wildlife Damage Management, Pierre, SD



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